

IN THE CLAIMS:

In line 1, delete "Claims" and insert:

C L A I M S

What is claimed is:

Please amend claims 1-21 to read as follows:

1. (Currently Amended) Apparatus In apparatus for the measurement of physical and/or chemical quantities using
  - a light source (122) and a light guide (124) to couple the light of the light source (122) in an optical resonator (12) shaped as microparticle, and
  - and means (128) for the observation of the light decoupled from the resonator (12),

characterized in that the improvement wherein

- the resonator (12) is at least partly mounted in a cutout (18) formed in the light guide (124) and fixed there mechanically and coupled optically to the light guide (124).

2. (Currently Amended) Apparatus according to claim 1,

wherein

- the cutout (18) is formed on a free end of the light guide (124) having an opening to the front side (20) of the light guide (124).

3. (Currently Amended) Apparatus according to ~~one of the~~

~~preceding claims~~ claim 1, wherein

- the light guide (124) is a hollow waveguide (34, 44).

4. (Currently Amended) Apparatus according to claim 3,

wherein

- the hollow waveguide (34, 44) has at least on at a first place position a larger inner diameter than on at a second place. position, The the first place is position being close to the a free end; and the second place is position being farther from the free end.

5. (Currently Amended) Apparatus according to ~~one of the~~

~~preceding claims~~ claim 1, wherein

- only one light guide (124) is present, and

- wherein the light guide (124) light propagates in a first propagation direction from the light source (122) to the resonator (12) and back from the resonator (12) in a second, opposite propagation direction.

6. (Currently Amended) Apparatus according to one of the preceding claims claim 1, wherein

- the resonator (12) contacts the light guide (124) on at at least two locations = which are separated by a distance, = and the resonator is held there in contact by clamping.

7. (Currently Amended) Apparatus according to one of the preceding claims 1 to 5 claim 1, wherein

- the resonator (12) is positioned on the light guide (124) in such a way that a gap remains between the resonator (12) and a light guiding part (34) of the light guide.

8. (Currently Amended) Apparatus according to one of the preceding claims claim 1, wherein

- the light guide (124) is tapered on at its free end.

9. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- the light guide (124) is ~~covered on~~ closed at its free end by at least one of a cap (82) or ~~closed by~~ and a sealing compound (92).

10. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- the light guide (124) has at least one lengthwise slit (52, 62) on its end.

11. (Currently Amended) Apparatus to measure physical and/or chemical quantities by a

- light source (192) and several light guides (194, 195) to couple light from the light source (192) in a resonator (12) shaped as a microparticle,
- and means (198) to observe light decoupled from the resonator (12),

~~characterized in that~~ the improvement wherein

- the resonator (12) is placed in the front part of a wedge-shaped sensing tip (132) with two converging bars (134a, 134b),
- where wherein the bars, (133a, 133b) or parts it consist consists of, light transmitting material and are coupled to two light guides (194, 195) on the rear end of the measuring tip; and  
wherein (132). A first of said light guides (194, 195) is connected to the light source (192) and a second light guide (194, 195) is connected to the an evaluation device tool (198).

12. (Currently Amended) Apparatus according to claim 11, wherein

- the rear part of the measuring tip (132) has a socket (131, 150) with openings (142a, 142b, 152a, 152b) to accept the light guides (194, 195), and
- where wherein said light guides (194, 195) are fitted in the openings (142a, 142b, 152a, 152b) and optically coupled to the light guiding material of the bars (133a, 133b).

13. (Currently Amended) Apparatus according to claim 11 and 12, wherein

- the sensing tip (132) has at least one of a ground plate (135) and/or and a cover plate (136).

14. (Currently Amended) Apparatus according to claim 13, wherein

- the cover plate (136) and/or and the ground plate (135) has have one or several lengthwise slits (138) at least in the a front part thereof.

15. (Currently Amended) Apparatus according to claim 13 or 14, wherein

- the cover plate (136) and/or and the ground plate (135) has have one lengthwise guide groove (160, 180) at least in the a front part thereof.

16. (Currently Amended) Apparatus according to one of the preceding claims claim 11, wherein

- several resonators (12a, 12b, 12c, 12d, 12e) are present; and

- said resonators ~~(12a, 12b, 12c, 12d, 12e)~~ are coupled to the same light guide ~~(102, 112)~~ or to the same light guides ~~(194, 195)~~.

17. (Currently Amended) Apparatus according to claim 16, wherein

- the resonators ~~(12a, 12b, 12c, 12d, 12e)~~ are made in such a way, that their particular optical resonances are excited by light with different frequencies.

18. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 11, wherein

- the resonator or the resonators ~~(12, 12a, 12b, 12c, 12d, 12e)~~ are shaped spherically or as ellipsoids.

19. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 11, wherein

- the light source ~~(122, 192)~~ is addressable to generate light with different wavelengths, and
- and the evaluation devices ~~(128, 198)~~ measure the intensity of the light decoupled from the resonator ~~(12)~~.

20. (Currently Amended) Apparatus according to ~~one of the~~  
~~claims 1-18~~ claim 11, wherein

- the light source (122, 192) emits broadband light; and
- ~~and the evaluation devices (128, 198) measure device~~  
measures the intensity of the light decoupled from the resonator (12) in dependence upon frequency dependent.

21. (Currently Amended) Apparatus according to claim 20,  
wherein

- the material of the resonator (12) is excited to fluorescence.